

Figure 1

Primer Sequences for PCR amplification of any SSA gene.

Primer names ECP 1 and ECP 2 [Expression cloning Primer (ECP)]

ECP 1 => 5' CAT AAA ATT TCT AAG ACG AAG GAT CCC TAT GTC 3'

ECP 2 => 5' GAG AGA AAG TTC CCC GTG TGA ATT CTA GCT AGG 3'

Figure 2

ATTGGATCTAAATAATGTACACTGGAGGTTCTGATTTTCTATTATGAAAGGGATAGA 57  
-35 -10 +1  
ATGTTAAATTTTATGATTTTATATAAAAAATAGATATAAAATTTAGTAGTTTAT 114  
AAATTTTTCATAACAAAGGACTATCCTCCTTGCATAAAATTTCTAAGACGAAAAATC 171  
RBS  
CCTATGTCAAATGAAACACTTTTGAGCGTACTTTCTGATGAAACGCACCTTTGCTAAT 228  
M S N E T L L S V L S D E T H F A N  
CTAGTTGATGAACCTTCTCTCATCTTGGTTAAAGACAGTATTTTCACTCAAGTAATA 285  
L V D E L L L I L V K D S I F T Q V I  
AAAGGCGAGGGAAGACAGAAATTAAGACATACTTACAGACACACTGGTAAGTTT 342  
K G E G K T E L K D I L T D N T G K F  
AAAGAACTTATAGAAAGTGCAGGTAAGACATACTAAAGAGATACTTACAGACAAT 399  
K E L I E S A G K D I L K S I L T D N  
ACCGCAATTTTAAAGGACTTATAGAAGGTAATGGTAAGACGGAGGCAAAAGAGGTA 456  
T G N F K G L I E G N G K T E A K E V  
CGCACTAATGAAAAATTCAGGAGCTTTTGGAGCAATGGTAAGGACATACTGAAA 513  
R T N E K F K E L F G S N G K D I L K  
GACATTCTTACTGATAACACCGGTAACCTTAAAGGCCTTATAGAAAGTGCAGCTAAG 570  
D I L T D N T G N F K G L I E S A A K  
GGTAAGCTGAAAGATCTTCTTATTGATGAAAAATTTCAAAATTTATTCGAGGATGAA 627  
G K L K D L L I D E K F Q K L F E D E  
ACGAAAGCTGGTCGTGTAAGAAATACTTACAGACAGCAACGCTAAGGAAATACTC 684  
T K A G R V K E I L T D S N A K E I L  
ACAAATGAAGTAGCAAAGAGGTAATCCGATAAATTCAGGAGGCAATAACT 741  
T N E V A K E V L K S D K F K E A I T  
GGCGATGGTAAGGACGCCTAAAGAGATACTTACTTGTGATAAATTTAAGAGGCT 798  
G D G K D A L K E I L T C D K F K E A  
GTAACAGGCAATGGTAAGACATACTAAAGGTATACTTACAGATAGCACTGGTAAA 855  
V T G N G K D I L K G I L T D S T G K  
TTTAAAGAACTTATAGAAAGTACTAGTAAAGACATACTAAAGAGATACTTACAGAT 912  
F K E L I E S T S K D I L K E I L T D  
AATACCGGTAACCTTAAAGGCCTTATAGAAAGCACTGGCAAGGAGAAAAGTAAAGAA 969  
N T G V F K G L I E S T G K E K V K E  
CTTCTTATCGATGGGAAGTTTAAAGACCTGTTTACTGATGCAACAAAAGCCGGTTAT 1026  
L L I D G K F K D L F T D A T K A G Y  
GTAAAAGAAATACTCACGAACGATACAGCTAAGGAAGTACTTACAGATCAAACAGCA 1083  
V K E I L T N D T A K E V L T D Q T A  
AAGGAGGTCCTAAAGATAGTACAGCTAAAGACATATTAAAGGACAGAAACGCAGCT 1140  
K E V L K D S T A K D I L K D T N A A  
GCGGTACTAAAAACAGCACAGCTAAAGAAATACTTACAAACCAACCGCTAAAGAA 1197  
A V L K N S T A K E I L T N Q T A K E  
GTGCTTACAGATGGTACATCCAAAGAGTACTAAAGAGATACTTACTTGTGATAAA 1254  
V L T D G T S K E V L K E I L T C D K  
TTTAAAGAGGCAGTAACAGGAGATGGTAAAGACATACTAAAGGTATACTTACAGAT 1311  
F K E A V T G D G K D I L K G I L T D  
AGCACTGGTAAGTTTAAAGAACTTATAGAAAGTACTGGTAAAGACATACTGAAAGAC 1368

Figure 2 (continued)

S T G K F K E L I E S T G K D I L K D  
 ATTCTTACAGATAGCACTGGTAAATTTAAAGAACTTATAGAAGTACTGGTAAAGAAC 1425  
 I L T D S T G K F K E L I E V L V K N  
 AAGCTAAAAGAGATTCTTACAGATAACACCGGTAACCTCAAAGGGCTTGTAGAAGGC 1482  
 K L K E I L T D N T G N F K G L V E G  
 GCCGGGAAGGATGAAGCAAAAGCAGTACTTACTGACGAGAAATTTAAAGGCTTGTTT 1539  
 A G K D E A K A V L T D E K F K G L F  
 GATGACAAAACAATAGCTGGCTATGTAAAGAAATACTCACCAGCGAGAAGTTTAAA 1596  
 O D K T I A G Y V K E I L T S E K F K  
 AAAGCTTTTGAAGTGCAGGTAAGACTAAAGTAAAGAACTCCTCATTGATGAGAAG 1653  
 K L F E S A G K T K V K E L L I D E K  
 TTTCAAAAATTATTTGAGGATGACACGAAAGCCAGTCATGTAAAGAAATACTCAGC 1710  
 F Q K L F E D D T K A S H V K E I L T  
 AACGATACAGCTAAGGAAATACTTACAGATCAACAGCTAAAGAAGTCCTAAAGGAT 1767  
 N D T A K E I L T D Q T A K E V L K D  
 AGTACAGCTAAAGAGATATTAAAGGACACAAACGCAGCTGCGCTACTAAAAGACAGC 1824  
 S T A K E I L K D T N A A A L L K D S  
 ACAGCAAAAGAGGTACTAAAATCCGATAAATTTAAAGATGCNATRACTGGTGCTGGT 1881  
 T A K E V L K S D K F K D A I T G A G  
 AAGGACGCACTAAAAGAGATACTTACTTGTGATAAATTTAAAGAGGCAGTAACAGGC 1938  
 K D A L K E I L T C D K F K E A V T G  
 AATGGTAAAGACATACTAAAAGGTATACTTACAGATAGCACTGGTAAATTTAAAGAG 1995  
 N G K D I L K G I L T D S T G K F K E  
 CTAATAGAAAGCACTGGTAAGGATAAGCTAAAAGAGATTCTTACAGATAACACCGGT 2052  
 L I E S T G K D K L K E I L T D N T G  
 AACTTTAAATTTCTTTGTAAGGCGCCGGTAAGGATGAAGCAAAAGCAGTACTTACT 2109  
 N F K F L V E G A G K D E A K A V L T  
 CACGAGAAATTTAAAGACTTGTAAATGTCAAAACAACAGCTGGCTACGTGAAGAA 2166  
 H E K F K D L F N V K T T A G Y V K E  
 ATACTTACCAGCGACAAGTTTAAAGAACTGTTTACTGATGCAACAAAAGCTGGCTAC 2223  
 I L T S D K F K E L F T D A T K A G Y  
 GTGAAAGAAATACTCACGAACGATACAGCTAAGGAAATACTTACAGATCAACAGGT 2280  
 V K E I L T N D T A K E I L T D Q T A  
 AAAGAAGTCCTAAAGGATGGTACAGCTAAAGACATATTAAAGGACACAAACGCACGT 2337  
 K E V L K D G T A K D I L K D T N A R  
 GCGCTACTAAAAGACAGCAGCCAAAGAAGTACTAAAATGCGATAAATTTAAGGAA 2394  
 A L L K D S T A K E V L K C D K F K E  
 GCAATAACAGGTGCGGGTAAAGATGAGCTAAAATACATACTCACTAATAGCGAGTTT 2451  
 A I T G A G K D E L K Y I L T N S E F  
 AAAAGCTTATTTCTATAGCAAGATAGCGCTGAAGCTGTTAAAGCAATATTTACCCAC 2508  
 K S L F H S K D S A E A V K A I F T H  
 AATRAAGTTTAAAGAACTACTTGAACATGCAAGAACAACCCAAACAATACGCAGGCGC 2565  
 N K F K E L L E H A R T T Q T I R R R  
 TTTGCAAAATGCTTTAGATCAACTAAAAGCGCTAATTACCTGTGGCAGCGGTGATCAT 2622

Figure 2 (continued)

F A N A L D Q L K A L I T C G S G D H

GCAACAAAAC TACAAGCCTTTGGAAGTGC ACTATGCACCAAAAAGAAGGAGTTGTGC 2679  
A T K L Q A F G S A L C T K K K E L C

AGTAATTTTAGCTGTGCAAACTGCAGTAGTACAACAAC TGCATAATTACGTAGCGCT 2736  
S N F S C A N C S S T T T A \*

AGGTGGGGGTAAATTACCCCCACCTAGCTAGATAATCACACGGGGAACTTTCTCTCTAT 2793  
Transcription termination

TACTAGGGTCTTAGGATTACAAACAAATTACTATGACAGCCA 2836

203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656
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ATTGGATCTAAATAATATACACTGGGAGTTCGTATTTTCTATTATGAAGGGGATAGA	57
-35 -10 +1	
ATGTTAAATTTTATGATTTTTTATAATAAAAAATAGATATAAAATTTAGTAATTTTAT	114
AAATTTTTTTATAACAAAGGACTACCCCTCCCTACATAAAATTTCTAAGACGAAAAATC	171
RBS	
CCTATGTCAAATGAAACACTTCTGAGCGTACTTTCTGATGAAACGCACCTTTGCTAAT	228
M S N E T L L S V L S O E T H F A N	
CTAGTTGATGAACCTTCTTCTCAGCTTGGTTAAAGACAGTATTTTCACTCAAGTAATA	285
L V D E L L L S L V K D S I F T Q V I	
AAAGGCGAGGGAAAGACAGAATTAAGACATTCTTACAGATAGCACTGGCAAGTTT	342
K G E G K T E L K D I L T D S T G K E	
AAAGAGCTGATAGGAAGTAGCGGTAAAGGATATACTAAAAAGCATACACACAGATGGC	399
K E L I G S S G K D I L K S I H T D G	
TCAGGCAACTTTAAAGGCCCTTATACAAAGCACAGGTAAGGCAGAAGTAAAGAGGTA	456
S G N F K G L I Q S T G K A E V K E V	
CTCACTAATGAAAAATTCAAAGAGCTTTTGGGAAGCGAAGGTAAAGACATACTAAAA	513
L T N E K F K E L F G S E G K D I L K	
GAGATACTTACAGACAATACCGGCAATTTTAAAGGGCTTATAGAAGGCAAGGTAAG	570
E I L T D N T G N F K G L I E G K G K	
GATGAAGCAAAGGGAGTACTTTACTGACGAGAAATTTAAAGGCTTGTTTGATGACAAA	627
D E A K G V L T D E K F K G L F D D K	
ACAATAGCTGGCTATGTAAAGAAATACTCACCAGCGAGAGTTTAAAAAACTGTTTG	684
T I A G Y V K E I L T S E S L K N C L	
AAAGGTGCAGGTAAGACTAAAGTAAAGAACTCCTCATTSTGAGAAGTTTCAA AAA	741
K G A G K T K V K E L L I D E K F Q K	
TTATTTGAGGATGACACGAAAGCCAGTGTGTAAAAGAAATACTTTACAGACAGTAAC	798
L F E D D T K A S H V F E I L T D S N	
GCTAAGGAAATACTCACAAAATGAAGTAGCAAAAGAGGTACTAAAAATCCGATAAATTT	855
A K E I L T N E V A K E V L K S D K F	
AAAGATGCAATAACTGGTGCTGGTAAGGACGCACTAAAGAGATACTTTACTTGGGAT	912
K D A I T G A G K D A L K E I L T C D	
AAATTTAAAGATGCAGTAACAGGTAATGGTAAGGACGCACTAAAGAAATACTTTACT	969
K F K D A V T G N G K D A L K E I L T	
TGCGATAAATTTAAAGATGCAGTAACAGGCAATGGTAAGGACAAGCTAAAGAGATT	1026
C D K F K D A V T G N G K D K L K E I	
CTTACTCACGAGAAGTTTAAAGCACTCATAGAGAGTGAAGGCAAGACATACTGAAA	1083
L T I E K F K A L I E S E G K D I L K	
GAAATTTCTACAGATAGTACCGGTAAATTTAAAGAGCTAATAGAAAATCACTGGTAAA	1140
E I L T D S T G K F K E L I E S T G K	
GACAAGCTAAAGAGATTTTTCACAGATAACACCGGTAACTTTAAAGGGCTTGTAGAA	1197
D K L K E I F T D N T G N F K G L V E	
GGCGCGGTAAAGGATGAAGCAAAAGCAGTACTTTACTCACGAGAAATTTAAAGACTTG	1254
G A G K D E A K A V L T H E K F K D L	
TTTAAATGACAAAACAACAGCTGGCTACGTGAAGGAAATACTCACCAGTGATAAGTTT	1311
F N D K T T A G Y V K E I L T S D K F	
AAAAAATTTTGGAGACAATACCAAGCTGGCTACGTGAAGGAAATACTCACGAAAC	1368

Figure 3 (continued)

K K L F E D N T K A G Y V K E I L T N  
 GATACAGCTAAGGAAATACTCACAATCAAACAGCTAAAGAAGTCCTAAAAGACAGC 1425  
 D T A K E I L T N Q T A K E V L K D S  
 ACAGCCAAAGAAATACTAAAATGCCATAAATTTAAGGACGCAATAACAGGCGCTGGT 1482  
 T A K E I L K C D K F K D A I T G A G  
 AAAGATGAGCTAAAATACATACTCACTAATAACGAGTTAAAAGCTTATTTGATAGC 1539  
 K D E L K Y I L T N N E F K S L F D S  
 AAAGATAGCGCTGAAGCTGTTAAAGCAATATTTACCCACAATAAGTTTAAAGAAGTA 1596  
 K D S A E A V K A I F T H N K F K E L  
 CTAAAACGTGCAAGGACAACCCAAAAATACGGCGGCGCTTGCAAGCTGCTTTAGAT 1653  
 L K T C K D N P K N T A A L A A A L D  
 GAACTAAAAGATCTAATTACGTGTGACCGCAATAATCATGCAACAAACTACAAGCC 1710  
 E L K D L I T C D R N N H A T K L Q A  
 TTTGGAAGTGCACTATGCACCAGAAAAAGAGTCGTGCGATAATTTAGCCCTGCA 1767  
 F G S A L C T R K K E S C D N F S P A  
 AGCTGCAGTAGTACAGCAGCTACATTAATTACGTAGCGCTAGGTGGGGGTAAATTACC 1824  
 S C S S T A A T                      Transcription termination  
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 TACTTTCAAATTACTATGACAGCCGATTAAATTATTATGACAGACGATACACTTTT 1937

Figure 4

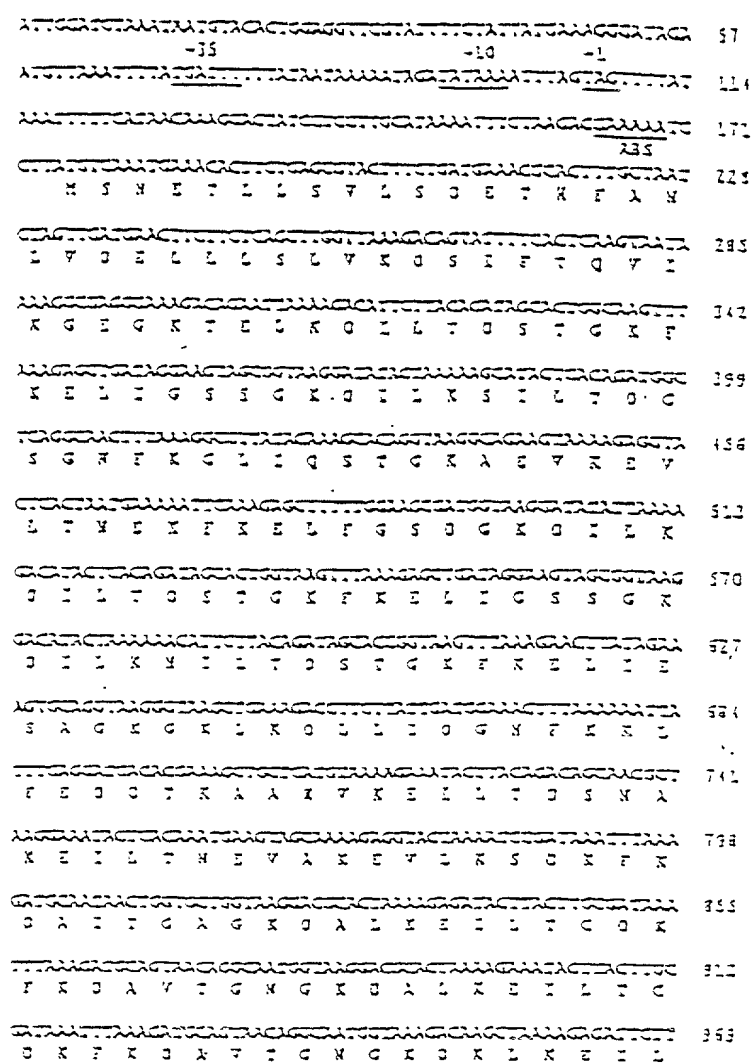


Figure 4 (continued)

ACTGACGGAATTTAAAGCACTGATGAGGTGAGGCAAGCACTCTGAAGAC 1026  
 T H E K F K A L E E S E G K O I L K O  
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 I L T Q S T G K F K E L I E S T G K O  
 GAGGCAAGGCGTACTTACTGACGAGAAATTTAAAGACTTGTATGACAAAC 1140  
 E A K A V E T Q E K F K O L F N O K T  
 ACAGTGGCTACTGGAAGAACTACTCCAGTGTATAGTTTAAAAATTAATTTAG 1137  
 T A G Y V K E I L T S O K F K K L F E  
 GACATACCAAGCTGGTACGTGAAGAACTACTCCAGCCTACAGCTTAAGGA 1254  
 D N T K A G Y V K E I L T N O T A K E  
 ATACTTACCAATCTAAATTTAAAGTAAAGATTAAGTGGCTGGTAAAGCACTACTG 1311  
 I L T N E K F K E A I T G O G K O I L  
 AAAGAAATTTCTACAGTACCACTGTAATTTAAAGGTCGAATTAAGTGGCTGGT 1368  
 K E I L T Q S T G N F K G A I T G A G  
 AAAGTACGCTAAATTAAGTACTCTAAAGGCTTTAAAGCTTATTTGATAGC 1425  
 K O Q L K Y I L T N S E F K S L F O S  
 AAAGTACGCTGAGCTTTAAAGAAATTAATTAAGTACGCTAAATTAAGCACTA 1482  
 K O S A E A V K E I F T H S K F K E L  
 CTTAAAGCTGCAAGGACACGCAAAATTAAGGCTGGCTGGCTGGCTTATAGT 1539  
 L K T C K O N P K N T A A L A A A L O  
 GAACTAAAGATCTAATTAAGTGGCTGGCTGGCTGGCTGGCTGGCTGGCTGGCT 1596  
 E L K O L E T C G S G D E A T K L Q A  
 TTTGGAGTGCATATGACGCAAAAAAGGCTGGTGGATTAATTTAGCTGTGCA 1653  
 F G S A L C T E K K E S C O N F S S A  
 AACTGAGTACTACACACTGCAATTAAGTGGCTGGCTGGCTGGCTGGCTGGCT 1710  
 M C S S T T T A \* Transcription termination  
 GCGACCTAGCTAGAACTACAGGCACTTCTCTCTAATTAAGCTTATAGGAT 1767  
 ACAAACAAATTAATTAAGGCA 1791



Figure 5

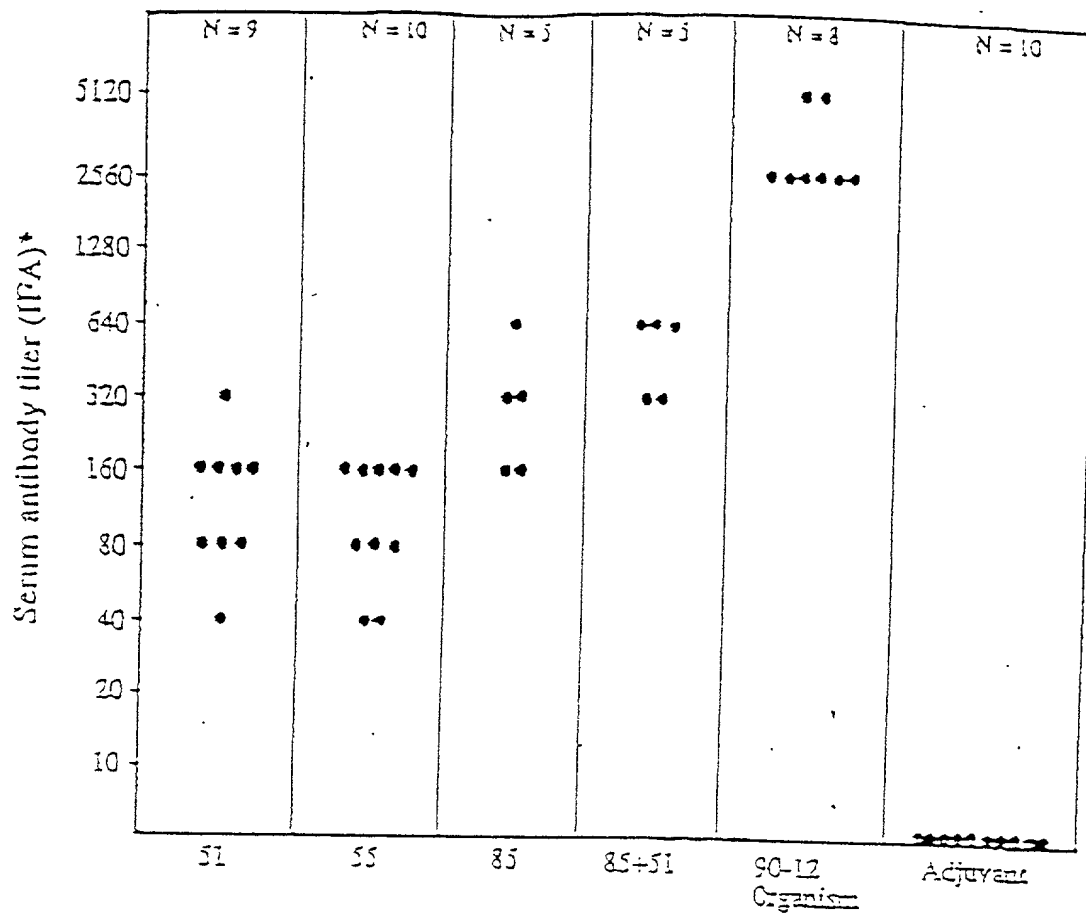
50kD antigen

MSNETLLSVLSDETHFANLVDELLLVKDSFTGVKCEGTELDLTOSTGKFKELIGSGKDLKSPITGGSGNFKGLQSTGKAEVKEVLTNEKF  
 KELFGSGEGKDLKELTONTGNFKGUECKGKDEAKGVLTDEYKGLFOOKTAGYVKELTSEDLKNCCLKGAGTKVKELIDEXFKLFEETKASHV  
 KELTSNNAKDLTNEVAKYVKSOKFKDANTGAGKDAALKELTCKFKDAYTNGKDAUKELTCKFKDAYTNGKDKKELTHERFKALUESG  
 KDLKELTOSTGKFKELIESTGKDLKELTONTGNFKGLVSGAGKDEAKAVLTHEFKYKLFNOKTTAGYVKELTCKFKELFEDNTKAGYVKELT  
 NGTAKELTNGTAKYVLDSTAKELKCKFKDANTGAGKDELKTLTNNEFKSLFOSKDSAEYKAFTTHNFKYELKTCXDNPKNTAALAAALDE  
 LKDLTCDRNHATKLQAFGSALCTRKESGDNFSPASGCTAAT

35kD antigen

MSNETLLSVLSDETHFANLVDELLLVKDSFTGVKCEGTELDLTONTGKFKELIESTGKDLKELTONTGNFKGLIENQKTEAKYVRTNEKF  
 KELFGSGEGKDLKELTONTGNFKGUECKGKDEAKGVLTDEYKGLFOOKTAGYVKELTSEDLKNCCLKGAGTKVKELIDEXFKLFEETKASHV  
 ILTCKFKDAYTNGKDKKELTOSTGKFKELIESTGKDLKELTONTGNFKGLIESTGKDKYKELIDEXFKLFOOKTAGYVKELTNGTAKYV  
 TOSTAKYVLDSTAKDLKDTNAAVYKNTAKELTNGTAKYVLTOSTGKFKELTCKFKDAYTNGKDKKELTOSTGKFKELIESTGKDLK  
 DLTOSTGKFKELIESTGKDLKELTONTGNFKGLVSGAGKDEAKAVLTHEFKYKLFNOKTTAGYVKELTCKFKELFEDNTKAGYVKELTNGTAK  
 FSDOTKASHYKELTNGTAKELTOSTAKYVLDSTAKELKSTNAAALKXSTAKYVKSOKFKDANTGAGKDAALKELTCKFKDAYTNGKDKK  
 KDLTOSTGKFKELIESTGKDLKELTONTGNFKGLVSGAGKDEAKAVLTHEFKYKLFNOKTTAGYVKELTCKFKELFEDNTKAGYVKELTNGTAK  
 ILTOSTAKYVLDSTAKDLKDTNARALLKSTAKYVLDSTAKELKSTNAAALKXSTAKYVKSOKFKDANTGAGKDAALKELTCKFKDAYTNGKDKK  
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Figure 6



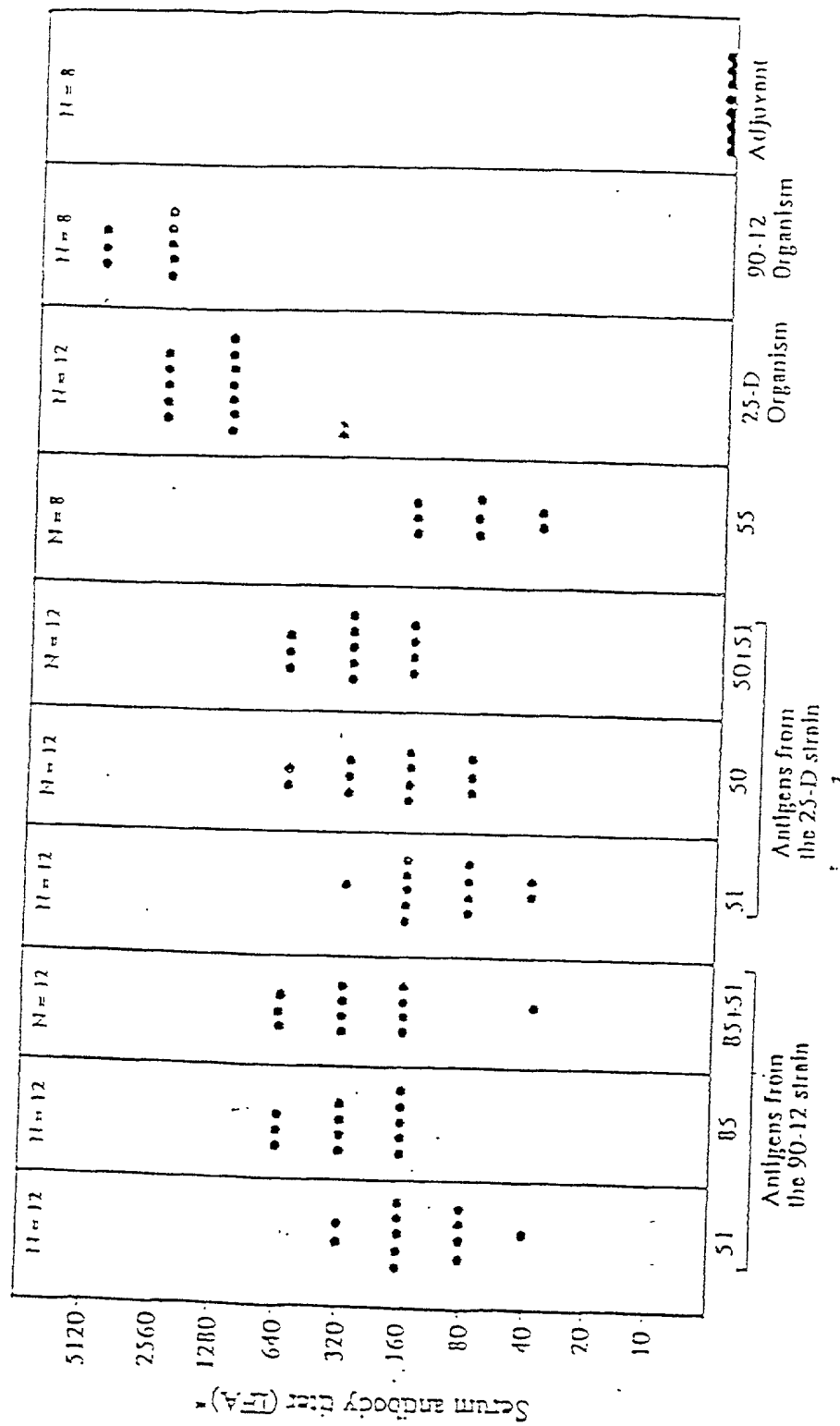


Figure 7

Figure 8

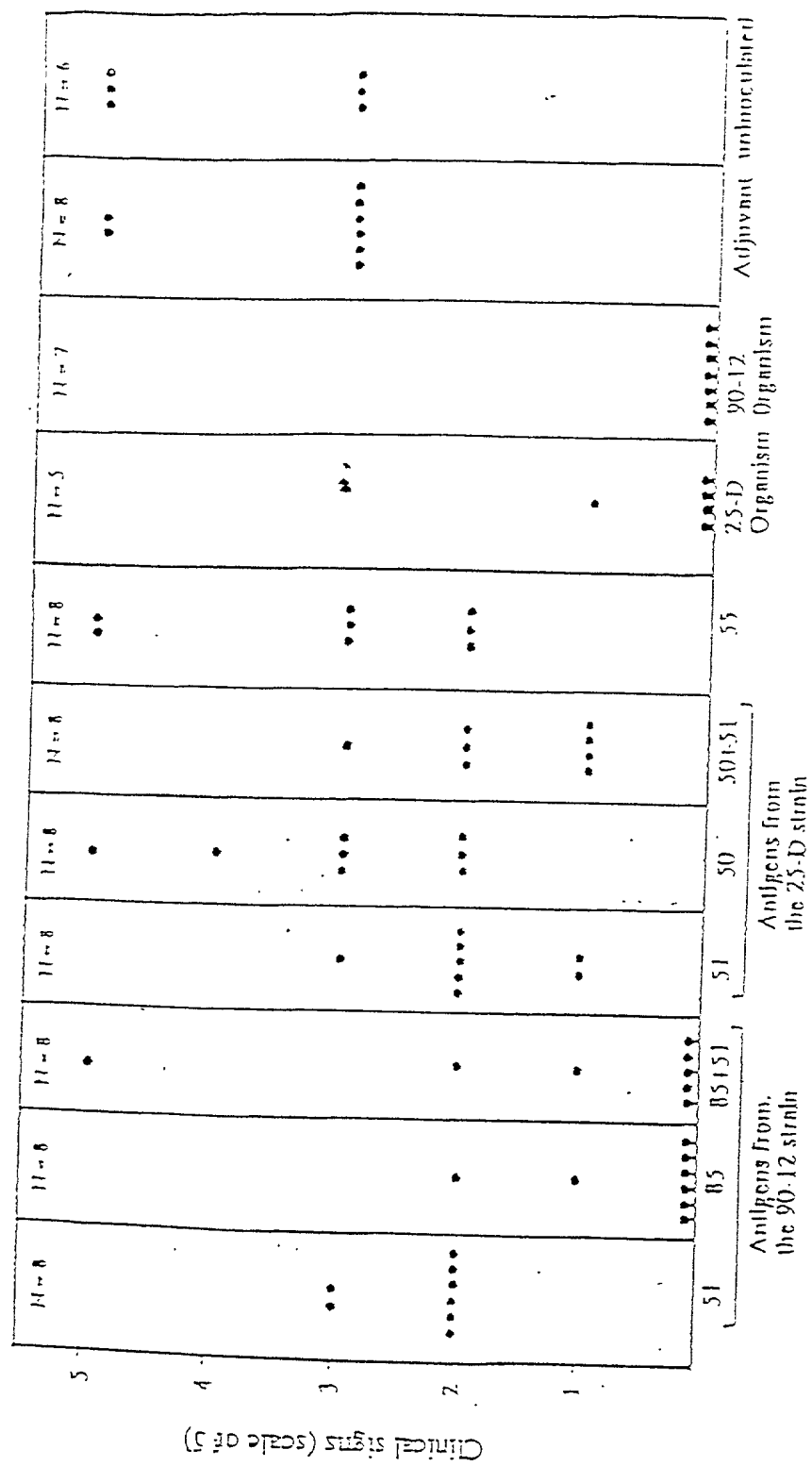


Figure 9

